


Internal documents reveal Tesla is blowing through an insane amount of raw material and cash to make Model 3s, and production is still a nightmare

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Linette Lopez Jun. 4, 2018, 3:42 PM



Tesla CEO Elon Musk unveils the new Tesla factory in Fremont, California, in October 2010.
AP

- **Tesla, the electric-car company helmed by the billionaire Elon Musk, is generating an incredible amount of waste in an effort to manufacture parts for the Model 3 at its Gigafactory in Nevada.**
- **Documents reviewed by Business Insider show that scrap at the Gigafactory may have cost the company at least \$150 million.**
- **Tesla told Business Insider that \$150 million was an overstatement.**
- **The company's attempt to ramp up Model 3 production has also led it to cut key parts of production, like ensuring that car parts are traceable.**

Tesla is wasting a jaw-dropping amount of raw material and cash to make the Model 3.

Internal documents reviewed by Business Insider show that the company expects that as much as 40% of the raw materials used to produce batteries and driving units manufactured at Tesla's Gigafactory in Nevada need to be scrapped or reworked by employees before they are sent to Tesla's factory in Fremont, California, and assembled into Model 3s. The documents were dated in the first quarter.

That is to say, for every 2,500 battery packs and driving units that leave the Gigafactory, an additional 1,000 pieces of "nonconforming material" is created. Half of that will be reworked and put into other car parts. The other half becomes scrap.

Tesla has spent almost \$150 million on scrap materials so far this year, according to internal estimates Business Insider has seen. That number does not include the overhead cost of creating that scrap (energy, labor hours, etc.). Tesla reported manufacturing 9,766 Model 3s in the first quarter of this year.

Tesla told Business Insider that \$150 million was an overstatement.

"As is expected with any new manufacturing process, we had high scrap rates earlier in the Model 3 ramp. This is something we planned for and is a normal part of a production ramp," Tesla said in a statement to Business Insider.

"Indeed, we have always explained that Model 3 margins would increase after costs begin to fall from elevated scrap and other early ramp issues — and they have. Our scrap rate for batteries has decreased by almost 60% since January as we have improved our manufacturing processes. It's also important to remember the reason we scrap parts: because we want to ensure that only the highest-quality parts are used to create the best vehicles for our customers. This is a part of the reason why Tesla's customer-satisfaction scores for Model 3 vehicle quality and condition are at an all-time high of 93%."

Whether or not Tesla is improving its process, this kind of inefficiency is expensive, especially so early in the process, industry experts told Business Insider. The Gigafactory manufactures the batteries and drive units (the electric motor, inverter, and gearbox) that go into Tesla's new much vaunted — but also much troubled — Model 3.

This is all a byproduct of the march to reach Tesla CEO Elon Musk's manufacturing target of 5,000 Model 3s per week by July.

What it is not a part of is Tesla's overarching goal of building eco-friendly cars, or Musk's ambition to create the most efficient and technologically impressive auto-manufacturing process the world has ever seen. The process has been frustrated by battery-supply issues and bottlenecks, by overautomation and recalcitrant robots — and it doesn't seem as if that's over by any means.

"That seems like just an awful lot of money," Rebecca Lindland, a senior director and executive analyst at Kelley Blue Book, told Business Insider. "As an investor, I'd ask: Is this a good use of my funds? And what kind of transparency is going on here?"

Lindland added: "When I've seen scrappage piles, it's a handful of units — front bumpers, door panels, and maybe you'll see a crate of 20 pieces ... You can't sustain a 20% rate of scrap and expect to make money."

Gigawhat?

In its first-quarter earnings report, Tesla told investors that it had "largely overcome this bottleneck" in its battery-module line at the Gigafactory.

But internal documents reviewed by Business Insider and an employee familiar with the matter who asked to remain anonymous tell a different story — one of incredible waste, hasty manufacturing, and continuous problems. "Production hell," as Musk has called it, is still a chaotic scramble of issues.

A specific example for you: In February, a misprogrammed robot that handles battery modules repeatedly punctured through the plastic housing (called a clamshell) and into some battery cells, the employee said, adding that instead of scrapping all the modules, some were fixed with adhesive and put back on the manufacturing line. According to internal documents Business Insider reviewed, this foible affected more than 1,000 pieces.

A Tesla representative said that the incident affected far fewer parts and that none of the punctured ones were released back to the manufacturing process. But Business Insider reviewed an internal log that showed the parts were put into hundreds of vehicles. We sent Tesla an identification number for one of the cars, and the company would neither confirm nor deny that the piece was in a finished vehicle. It said only that if the piece were a safety concern, it would not be used.

In mid-April, thousands of bandoliers (a part used to create battery modules) were manufactured with an adhesive that was mixed incorrectly, according to the employee. Images shared with Business Insider show these parts sitting on the Gigafactory floor.

Tesla denies the claim.

A Tesla spokesperson said that the pieces are neither connected nor energized, and that they are being kept in a temperature-controlled room. The company insisted that they pose no safety threat.

The cost of scrap has become so dramatic that, internally, Tesla documents sometimes quantify the amount of money wasted by comparing it to another eye-popping number — like the scrap cost's equivalent measured in miles of \$5 footlong Subway sandwiches (137.11 miles, in one case).

Two charts showing inverter scrap costs from the start of the year to the end of May were accompanied by a calculation of how many new Model 3s someone could buy with the money wasted — 103.42 cars, to be exact.

A similar set of charts calculating scrap costs for rotors noted that it could have purchased 4,878 hats for Musk's Boring Company, priced at about \$20 apiece.

Business Insider also reviewed dozens of pictures of scrap piled high inside the Gigafactory. Some of it is flammable material used to create lithium batteries. Our source said some of these batteries presented a hazard as they're connected. Tesla said that was patently false, that all nonconforming materials are kept in a temperature-controlled room, and that they pose no safety threat.

What's more, our source said that a significant amount of scrap was stored at a warehouse on Gigafactory's campus off of Ireland Drive. Tesla said that wasn't the case and that the Ireland Drive facility houses only parts received from suppliers.

Gigawho?

During Tesla's first-quarter earnings call, Musk said some of the bottlenecks Tesla was experiencing were due to overautomation. To fix that, he told investors, Tesla "temporarily reduced automation in these areas and introduced semi-automated or manual processes."

Basically, he turned off some of the machines. That alone had industry analysts we spoke with raising an eyebrow. Machines, when useful, are supposed to provide services humans can't, like consistent quality and torque, on top of lifting heavy objects. If they aren't useful, though, turning them off shouldn't matter.

Either way, the employee told Business Insider that the process for deciding what stays on and what goes off had been less than scientific at times. Some machines in the Gigafactory have been turned off simply because they added more time to the manufacturing process than Musk liked when he observed them working on the Gigafactory floor.

An example: In May, Gigafactory employees turned off the "criticality" of the "genealogy" on a specific component in the Tesla battery pack, according to an internal email viewed by Business Insider.

In layman's terms, that means they bypassed putting a tracking system on that specific part (the bandolier) in that stage of the manufacturing process to speed things up.

It's common practice for automakers to create a genealogy for every part in a car. That way, if something goes wrong, the part's source manufacturer, production time, serial number, lot number, expiration date, and more can all be traced. It follows the part through its entire life in the manufacturing process before it gets to your car. This is especially important during recalls because it ensures that companies can locate potentially defective parts.

Now that's no longer the case for at least one part in the Gigafactory-made batteries. Tesla said they were being tracked by lot number because laser-etching the parts individually was causing them to be scrapped. The company did not provide Business Insider the number of parts in a lot or explain why that was the case. It said that while it would not get into internal procedures, any modifications it made to the genealogy were to make the process better.

"[Musk's] obsession with production speed — he might achieve it, but at what cost?" Mark Schirmer of Cox Automotive said. "Reaching 5,000 in June or July is going to be a small success if there's further pain down the road."

Tesla has never turned an annual profit — a source of consternation for Musk, who, though fairly intolerant of criticism, has acknowledged that Tesla "isn't a real company" until it does.

In the first quarter, the company's net cash used in operating activities increased by \$328.6 million from the same period a year before. This was in part because of the Model 3 ramp-up. Expense has not been spared, but what investors should ask themselves is: Could it have been?

"If he's going to be an auto manufacturer, he has to be held to auto-manufacturing standards," Lindland said. "If Honda or GM had these kinds of scrappage rates or waste, Wall Street wouldn't stand for that ... Nobody would be saying, 'You're just a hater.'"

If you have more information about manufacturing at Tesla, feel free to give me a shout at llopez@businessinsider.com.

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